REMARKS

Claims 1-31 are currently pending in the application. Claims 1-6, 8-10, 20-22, and 24-30 stand rejected under 35 U.S.C. § 102(b) and §103(a). The above amendments and the following remarks are considered by Applicants to overcome each rejection raised by the Examiner and to place the application in condition for allowance. An early Notice of Allowance is therefore requested.

Claims 1-4, 6, 8-10, 20-22, 24, 25, and 27-30 stand rejected as being anticipated by Takahashi et al. (U.S. Patent Publication No. 2002/0140787). This rejection is traversed and believed overcome in view of the following discussion.

Takahashi is directed to a piezoelectric transducer that includes a piezoelectric place in which a plurality of piezoelectric ceramic layers are stacked one on another. A pair of driving electrodes are provided on the opposite surfaces of the piezoelectric plate. When an electric field extends perpendicularly with the polarized directions, the electric field is applied by the driving electrodes through the piezoelectric plate. The piezoelectric plate is deformed in a shear mode, thereby applying an ejection pressure to ink accommodated inside the ink chamber.

It is respectfully submitted that Takahashi fails to teach or suggest all the features recited in independent claims 1 and 20. Specifically, Takahashi fails to teach or suggest a plurality of second electrodes which are embedded in a second area of said one of the first and second portions of the sheet member, such that the second electrodes are separate from each other in the second area, the second area being adjacent to the first area in a surface direction parallel to one of a first surface of the first portion and a second surface of the second portion, the first surface and the second surface being opposite to each other in the direction of thickness of the sheet member.

The Examiner indicates that Figure 25 of the Takahashi discloses the feature of a plurality of second electrodes as provided in the claimed invention. Applicants respectfully disagree. Figure 25 of Takahashi illustrates a plurality of internal first electrodes 413a – 413f and a plurality of internal second electrodes 412a-412f. The first electrodes are interposed between the uppermost piezoelectric layer 411e and the second uppermost piezoelectric layer 411a and the second electrodes 412 are interposed between the lowermost piezoelectric layer 411f and the second lowermost piezoelectric layer 411d. In contrast to the teachings of Takahashi, the claimed invention does not provide the first and second plurality of electrodes in one area between the uppermost and lowermost piezoelectric layer. The claimed invention actually provides a first plurality of electrodes in a first area and the second plurality of electrodes in a second area. The first area and the second area are not positioned above either other. As can be seen in figure 1 of the present application the first area and the second area are distinct from each other. The first plurality of electrodes is positioned in the first area and the second plurality of electrodes are in the second area. Takahashi, however, discloses that all the electrodes are positioned over each other throughout the piezoelectric layers. In other words, the first and second electrodes are positioned over each other rather than in separate areas as in the claimed invention.

Therefore, it is submitted that Takahashi fails to teach or suggest a plurality of second electrodes which are embedded in a second area of said one of the first and second portions of the sheet member, such that the second electrodes are separate from each other in the second area, the second area being adjacent to the first area in a surface direction parallel to one of a first surface of the first portion and a second surface of the second portion, the first surface and the second surface being opposite to each other in the direction of thickness of the sheet member. Thus, Applicant request the withdrawal of the rejection of independent claims 1 and 20 under 35 U.S.C. 102(b).

Regarding Claim 2, all of the first and second electrodes 413, 412 of Takahashi are completely embedded in the piezoelectric sheet 411, and accordingly Takahashi et al does not teach or suggest a feature of Claim 2 that the first electrodes and the second electrodes extend from said one of the first and second surfaces of the first and second portions of the sheet member in the direction of thickness thereof. According to the invention recited in Claim 2, the first and second electrodes can be easily embedded in the sheet member, and accordingly the claimed pressure producing apparatus can be produced at low cost.

Regarding Claim 3, Takahashi teaches, at paragraph [0148] of the specification and in Fig. 29, that the direction of the driving electric field is substantially perpendicular to the polarizing direction A', and thus teaches away from a feature of Claim 3 that an electric field is applied to each of the active portions of the sheet member in a same direction as the direction of polarization of said each active portion.

In addition, Claims 2-4, 6, 8-9, 20-22, 24, 25, and 27-30 are dependent upon one of claims 1 and 20. It is submitted that these claims recite patentable subject matter for at least the reasons mentioned above. Therefore, Applicants request the withdrawal of the rejection of claims 2-4, 6, 8-9, 20-22, 24, 25, and 27-30 under 35 U.S.C. 102(b).

Claims 5 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi in view of Takuchi (U.S. Patent No. 5,592,042). The Examiner takes the position that the combination of Takahashi and Takuchi teach or suggest the features recited in claims 5 and 26. Applicants respectfully disagree.

Takuchi is directed to a piezoelectric/electrostrictive actuator having a substrate, a plurality of electrodes in the form of strips, and a piezoelectric/electrostrictive portion which is disposed between the adjacent strips of the electrodes in the spacing direction. The strips are formed on at least one surface of the substrate such that the electrode strips are spaced from each other in a direction parallel to the substrate surface. The piezoelectric/electrostrictive portion is disposed between the adjacent strips of the electrodes in the spacing direction, and in contact with the adjacent electrode strips, so that the piezoelectric/electrostrictive portion produces a flexural displacement or force due to the application of voltage between the adjacent electrode strips.

Claims 5 and 26 are dependent upon claim 1. It is submitted that Takuchi fails to cure the deficiencies of Takahashi. Specifically, neither reference teaches or suggests a plurality of second electrodes which are embedded in a second area of said one of the first and second portions of the sheet member, such that the second electrodes are separate from each other in the second area, the second area being adjacent to the first area in a surface direction parallel to one of a first surface of the first portion and a second surface of the second portion, the first surface and the second surface being opposite to each other in the direction of thickness of the sheet member. It is submitted that claims 5 and 26 recite patentable subject matter, for at least the reasons mentioned above. Therefore, Applicants requests the withdrawal of the rejection of claims 5 and 26 under 35 U.S.C. 103(a).

In view of the above amendments and remarks, Applicant submits claims 1-6, 8-10, 20-22, and 24-31, recite subject matter that is neither taught nor suggested by the applied references. Thus, for the reasons presented above, claims 1-6, 8-10, 20-22 and 24-31 are believed by Applicant to define patentable subject matter and should be passed to issue at the earliest possible time. A Notice of Allowance is requested.

Respectfully submitted,

Eugene LeDonne
Reg. No. 35,930
REED SMITH LLP
599 Lexington Avenue
New York, NY 10022
(P) 212-521-5449
Attorney for Applicant

ED:BKS:JWT